MINERAL PRODUCTION OF IOWA IN 1898.

BY SAMUEL W. BEYER.

VALUE OF MINERAL PRODUCTION.

COAL	$5,123,187
CLAY	2,057,022
STONE	563,586
LEAD AND ZINC	43,784
TOTAL VALUE	$7,787,579

MINERAL PRODUCTION OF IOWA IN 1898

BY S. W. BEYER.

The kindly reception accorded the mineral statistics of Iowa for 1897 lead the Iowa Geological Survey to undertake their collection for 1898. It was the extreme good fortune of this department to secure the co-operation of the division of mineral statistics of the United States Geological Survey. All blanks, with return envelopes, were sent from Washington, and duplicates of all returns were forwarded promptly to the local office, thus saving the State a large amount of routine work, and the operators the annoyance of a confusing multiplicity of requests from two offices. The state organization assumed the responsibility of looking up the delinquents.

The very prompt and hearty co-operation shown by the producers deserves, and has, the fullest thanks of the Survey. They have, with almost no important exceptions, responded promptly and willingly. Many have asked for copies of the report when completed, thus expressing their appreciation of the work. Not a single important coal operator has failed to report, and it is believed that the coal output is correct within 3 per cent. The same is essentially true for clay and stone. One estimate is included with the totals for clay, but this plant was visited by the writer and the figures submitted are believed to be reliable.

The figures for the production of gypsum could not be obtained. The output for 1896 was $34,020. The steady improvement of trade conditions and great increase in build-

ing during the past two years has, probably more than doubled the output.

The increased production of lead and zinc, stimulated by the recent advance in the prices of those metals, is most gratifying.

Total Production.

Eighty-nine counties and nearly seven hundred producers were engaged in developing the mineral resources of the state in 1898.

The value of the total mineral production in 1898 was $7,787,579; distributed as follows:

	VALUE.	NO. OF PRODUCERS.
Coal	$ 5,123,187	188
Clay	2,057,022	349
Stone	563,586	161
Lead and zinc	43,784	10
Total	$ 7,787,579	708

According to the United States Geological Survey the output of the above products for 1897 were:

Coal	$ 5,219,503
Clay	1,821,247
Stone	495,343
Lead and zinc*	5,866
Total	$ 7,541,959

The production is shown by counties in Table I.

*Iowa Geological Survey.

TABLE I.

Total Value of Mineral Production by Counties.

COUNTIES.	Total clay.	Total coal.	Total stone.	Miscellaneous.	Total.
Adair	$ 2,220	.....	.....	.....	$ 2,220
Adams	6,700	$ 18,108	.....	.....	24,808
Allamakee	.....	.....	$ 160	.....	160
Appanoose	14,725	726,932	84	.....	741,741
Audubon*	.....	.....	.....	.....	.....
Benton	14,040	.....	3,556	.....	17,596
Black Hawk	16,142	.....	3,980	.....	20,122
Boone	26,620	473,342	.....	.....	499,962
Bremer	1,596	.....	.....	.....	1,596
Buchanan	1,988	.....	118	.....	2,106
Buena Vista	6,800	.....	.....	.....	6,800
Calhoun	5,933	.....	.....	.....	5,933
Carroll	9,100	.....	.....	.....	9,100
Cass	11,800	.....	.....	.....	11,800
Cedar	6,210	.....	113,502	.....	119,712
Cerro Gordo*	.....	.....	.....	.....	.....
Cherokee	10,560	.....	.....	.....	10,560
Clarke*	.....	.....	.....	.....	.....
Clay*	.....	.....	.....	.....	.....
Clayton	8,391	.....	4,820	.....	13,211
Clinton	20,790	.....	1,628	.....	22,418
Crawford	12,500	.....	.....	.....	12,500
Dallas	28,703	13,052	.....	.....	41,755
Davis*	.....	490	.....	.....	490
Decatur	6,700	.....	3,275	.....	9,975
Delaware	6,175	.....	.....	.....	6,175
Des Moines	26,912	.....	12,135	.....	39,047
Dubuque	35,110	.....	23,183	$43,784	102,077
Fayette*	.....	.....	.....	.....	.....
Floyd*	.....	.....	.....	.....	.....
Franklin	1,656	.....	.....	.....	1,656
Fremont	10,075	.....	.....	.....	10,075
Greene*	.....	21,318	.....	.....	21,318
Grundy	5,550	.....	300	.....	5,850
Guthrie	56,039	3,020	.....	.....	59,059
Hamilton	59,800	.....	.....	.....	59,800
Hardin	16,875	.....	7,400	.....	24,275
Harrison	11,285	.....	.....	.....	11,285
Henry	17,575	.....	6,400	.....	23,975
Howard	7,575	.....	773	.....	8,348
Humboldt*	.....	.....	.....	.....	.....
Ida*	.....	.....	.....	.....	.....
Iowa	38,600	.....	.....	.....	38,600
Jackson	4,950	.....	64,030	.....	68,980
Jasper	22,700	219,481	.....	.....	242,181
Jefferson	11,832	1,386	1,000	.....	14,218
Johnson	16,880	.....	3,738	.....	20,618
Jones	9,799	.....	95,359	.....	105,158
Keokuk	21,910	265,886	3,263	.....	291,059

*Single producers of certain articles.

TABLE I—CONTINUED.

COUNTIES.	Total clay.	Total coal.	Total stone.	Miscellaneous.	Total.
Kossuth*	.....	.....	.....	.....	.....
Lee	20,425	.....	28,724	.....	49,149
Linn	32,359	.....	18,560	.....	20,919
Louisa	7,100	.....	1,626	.....	8,726
Lucas	2,000	12,000	.....	.....	14,000
Madison	3,850	.....	11,647	.....	15,497
Mahaska	56,580	1,304,727	503	.....	1,361,810
Marion	16 275	113,329	2,481	.....	132,085
Marshall	31,355	.....	51,393	.....	82,748
Mills	8,785	.....	.....	.....	8 785
Mitchell	.....	.....	3,268	.....	3,268
Monona*	.....	.....	.....	.....	.....
Monroe	1,476	594,980	130	.....	596,586
Montgomery	27,397	.....	1,830	.....	29,227
Muscatine	25,811	.....	.....	.....	25,811
Page	21,220	14,333	.....	.....	35,553
Plymouth*	.....	.....	.....	.....	.....
Pocahontas*	.....	.....	.....	.....	.....
Polk	347,257	787,940	.....	.....	1,135,197
Pottawattamie	52,837	.....	.....	.....	52,837
Poweshiek	9,915	.....	.....	.....	9,915
Ringgold	8,350	.....	.....	.....	8,350
Sac*	.....	.....	.....	.....	.....
Scott	43,456	.....	31,131	.....	74,587
Shelby*	.....	.....	.....	.....	.....
Sioux	1,800	.....	.....	.....	1,800
Story	16,220	11,554	1,125	.....	28,899
Tama	41,195	.....	350	.....	41,545
Taylor	10,600	12,485	.....	.....	23,085
Union	8,050	.....	.....	.....	8,050
Van Buren	8.800	9,610	9,541	.....	27,951
Wapello	55,221	258,561	16,150	.....	329,932
Warren	1,225	11,070	.....	.....	12,295
Washington	21,672	.....	6,405	.....	28,077
Wayne	7,505	68,633	.....	.....	76,138
Webster	78,158	180,750	3,487	.....	262,395
Winnebago	2,874	.....	.....	.....	2,874
Winneshiek	5,100	.....	630	.....	5,730
Woodbury	128,200	.....	.....	.....	128,200
Wright	8,618	.....	.....	.....	8,618
Single producers	97,981	.....	.....	.....	97,981
Burnt clay ballast and unspecified	221,712	.....	.....	.....	221,712
Total	$2,057,022	$5,123,187	$563,586	$43,784	$7,787,579

*Single producers of certain articles.

COAL.

The output of coal for 1898 shows a slight falling off as compared with the production for 1897, both in tonnage and

in cash value. The open winter of 1897 and 1898, greatly affected the local demand and the opening of new fields in the southwest deprived Iowa of a portion of her railway clientage in that quarter. While the average price per ton ruled slightly higher, the total shrinkage in production was almost a hundred thousand tons. Of the great coal producing counties, Appanoose, Jasper, Keokuk, Mahaska, Marion and Webster, show a decrease, while Boone, Monroe, Polk and Wapello show a handsome increase. Of the total output 11 per cent was sold locally or consumed at the mine while 89 per cent was loaded on the cars and shipped to various points in and out of the state, chiefly to the west and south of the producing areas. Table II gives the total tonnage, average value, total value, number of mines producing, average number of days worked and number of men employed, arranged by counties.

TABLE II.

Coal Output by Counties.

COUNTIES.	Mines reporting	Tons.	Price per ton.	Value.	Average No. days worked.	Men employed.
Adams	11	9,822	$ 1.84	$ 18,108	169	83
Appanoose	41	608,165	1.19	726,932	175	2,008
Boone	14	331,543	1.43	473,342	209	1,110
Dallas	3	8,859	1.46	13,052	224	36
Davis	1	391	1.25	490	130	3
Greene	5	12,920	1.65	21,318	194	54
Guthrie	2	1,510	2.00	3,020	120	7
Jasper	6	151,816	1.45	219,481	238	267
Jefferson	2	1,025	1.35	1,386	120	7
Keokuk	7	251,145	1.06	265,886	186	558
Lucas	1	6,600	1 82	12,000	200	22
Mahaska	17	1,292,787	1.01	1,304,727	229	2,239
Marion	14	127.293	.89	113,329	217	487
Monroe	7	584,578	1.02	594,980	224	1,040
Page	2	6,370	2.25	14,333	200	23
Polk	15	635,606	1.22	787,940	219	1,340
Story	1	7,885	1.46	11,554	180	31
Taylor	2	6,555	1.91	12,485	193	27
Van Buren	2	6,605	1.45	9,610	258	14
Wapello	10	252,484	1.02	258,561	212	478
Warren	5	7,514	1.47	11,070	78	48
Wayne	7	51,550	1.33	68,633	164	253
Webster	13	137,787	1.31	180,750	212	379
Total	188	4,500,810	$ 1.14	$5,123,187	218	10,514

In the above table no attempt was made to keep separately the various sizes of coal put upon the market. Nut and slack are included and would tend to make the price per ton lower than for lump coal alone. This would not affect the results for the Centerville district, for the very persistent parting which is everywhere present in the principal vein worked, is mined with the coal, passes through the screen and renders the slack unmarketable.

Table III compares the output for 1898 with the most reliable figures for the preceding six years:

TABLE III.

YEARS.	SHORT TONS.	Price	VALUE.	AUTHORITY.
1892	3,918,491	$1.32	$5,175,060	United States Geological Survey.
1893	3,972,229	1.30	5,110,460	United States Geological Survey.
1894	3,967,253	1.26	4,999,939	United States Geological Survey.
1895	4,156,074	1.20	4,982,102	United States Geological Survey.
1896	3,954,028	1.17	4,628,022	United States Geological Survey.
1897	4,611,865	1.13	5,219,503	United States Geological Survey.
1898	4,500,810	1.14	5,123,187	Iowa Survey.

The number of men employed in the mines of Iowa for 1898 shows a falling off of nearly 200, while the average number of days worked was greater than for any year since 1892. The number of men employed and the average number of days worked during the past six years, according to the best information available, was as follows:

YEAR.	Av. number of active days.	Number of men employed.
1893	204	8,863
1894	170	9,995
1895	189	10,066
1896	178	9,672
1897	201	10,703
1898	218	10,514

According to the United States Geological Survey Iowa, in 1897, ranked sixth in bituminous coal tonnage, and fifth according to the market value of the product, and first in both tonnage and value of the states west of the Mississippi. The production of the ten leading states was as follows:

	STATE.	TONS.	VALUE.
1.	Pennsylvania	54,597,891	$37,636 347
2.	Illinois	20,072,758	14,472,529
3.	West Virginia	14 246.159	8,987,393
4.	Ohio	12,196,942	9,535,409
5.	Alabama	5,893,770	5.192,085
6.	Iowa	4,611,865	5,219,503
7.	Maryland	4,442,128	3,363,996
8.	Indiana	4,151,169	3,472,348
9.	Kentucky	3,602,097	2.828,326
10.	Colorado	3,361,703	3,947,186

Clay.

The value of the clay products marketed during 1898, exceeded that of 1897 by nearly a quarter of a million dollars, and was the greatest since 1894. There was a sharp falling off in the output and sale of paving brick and draintile, but a marked increase in common brick. The greatest gain, however, was in the production of a burnt clay, which has gained great favor in the southern half of the state as a ballast. More than $200,000 worth of burnt clay, alone, was sold during the past year.

In 1896, nearly 35 per cent of the firms reporting were idle, in 1897 slightly more than 20 per cent, while in 1898 the percentage of firms not in operation was still less.

Of the great clay producing centers, Polk county alone shows a falling off, and that scarcely more than 3 per cent. The chief gain comes, however, from the large number of small firms which have been revived or brought into existence by the betterment of general trade conditions, especially in the building trade.

Fancy work and pottery show a slight decrease and it seems improbable that Iowa will ever become a dangerous competitor

of the eastern Mississippi valley states in that line, unless new deposits of clay are discovered or new methods of working introduced.

The returns show 349 plants in active operation, a gain of 19 over 1897, and give the total value of brick produced at $1,415,165, and of all clay products, $2,057,022, showing a gain of $83,405 and $238,138, respectively. These amounts were distributed as follows:

	Thousa ds.	Price per thousand.	Value.
Common brick	181,331	$5 90	$ 1,069,947
Pressed brick	6,722	8.14	54,752
Vitrified brick	35,357	8 24	290,463
Fancy brick	.....	.....	993
Fire brick	.....	.....	5,525
Draintile	.....	.....	343,265
Sewer pipe	.....	.....	33,000
Terra cotta	.....	.....	350
Fire proofing	.....	.....	2,161
Floor tile, etc	.....	.....	429
Burnt clay	.....	.....	203,639
Pottery	.....	.....	34,425
Hollow brick, etc	.....	.....	18,073
Total	.....	.....	$ 2,057,022

According to the United States Geological Survey, the totals for 1895 to 1897, were as follows:

	1895.	1896.	1897.
Common brick	$1,095,074	$1,003,624	$ 850,834
Pressed brick	87,130	47,386	57,230
Vitrified brick	243,928	112,985	426,056
Fancy and ornamental brick	2,300	.....	2,800
Fire brick	5,920	5,198	8,700
Draintile	290,5 5	225,650	372,070
Sewer pipe	55, 31	73,039	44,300
Ornamental terra cotta	2,800	800	500
Fire proofing	400	7,685	7,540
Tile—not drain	16,094	2,000	6,700
Pottery	25,600	42,710	38,64(
Unclassified	45,400	173,000	5,501
Total	$1,870,292	$1,694,402	$1,821,247

Works in active operation reporting: 1896, 339; 1897, 330.

The production by counties is given in Table IV. Counties

in which but one plant is reported as active in 1898, are mentioned in their proper order, but their production is not given separately.

TABLE IV.

Clay Production by Counties.

COUNTY.	Number of producers	THOUSANDS.		VALUE.		
		Common brick.	Total brick.	Common brick.	Total brick.	Total clay.
Adair	2	370	370	$ 2,220	$ 2,220	$ 2,220
Adams	3	1,200	1,200	6,200	6,200	6,700
Appanoose	3	1,650	2,750	8,125	15,725	15,725
Audubon	1	.....	.....	.....	.....	.....
Benton	6	1,155	1,655	6,930	10,430	14,040
Black Hawk	3	2,432	2,432	14,992	14,992	16,142
Boone	10	1,615	2,465	9,600	15,600	26,620
Bremer	2	240	240	1,596	1,596	1,596
Buchanan	2	325	325	1,988	1,988	1,988
Buena Vista	2	300	300	2,200	2,200	6,800
Calhoun	3	55	55	405	405	5,933
Cass	3	1,700	1,700	11,800	11,800	11,800
Carroll	3	1,400	1,400	9,100	9,100	9,100
Cedar	2	487	487	3,310	3,310	6,210
Cerro Gordo	1	.....	.....	.....	.....	.....
Cherokee	2	1,800	1,800	10,400	10,400	10,560
Clarke	1	.....	.....	.....	.....	.....
Clay	1	.....	.....	.....	.....	.....
Clayton	4	1,400	1,400	7,550	7,550	8,391
Clinton	4	3,795	3,795	16,740	16,740	20,790
Crawford	4	1,900	1,900	12,500	12,500	12,500
Dallas	9	1,912	2,086	11,351	13,189	28,703
Davis	1	.....	.....	.....	.....	.....
Decatur	3	1,000	1,025	6,100	6,400	6,700
Delaware	3	800	875	4,450	4,975	6,175
Des Moines	6	900	2,485	4,900	18,612	26,912
Dubuque	7	7,045	7,045	35,110	35,110	35,110
Fayette	1	.....	.....	.....	.....	.....
Floyd	1	.....	.....	.....	.....	.....
Franklin	2	254	254	1,522	1,522	1,656
Fremont	5	1,870	1,870	10,075	10,075	10,075
Greene	1	.....	.....	.....	.....	.....
Grundy	3	625	625	3,750	3,750	5,550
Guthrie	6	2,740	3,240	17,038	20,538	56,039
Hamilton	2	5,200	5,200	31,200	31,200	59,800
Hardin	3	280	280	1,800	1,800	16,875
Harrison	6	1,830	1,830	10,785	10,785	11,285
Henry	5	825	825	4,775	4,775	17,575
Howard	2	750	1,055	4,000	6,775	7,575
Humboldt	1	.....	.....	.....	.....	.....
Ida	1	.....	.....	.....	.....	.....
Iowa	6	3,700	3,700	21,200	21,200	38,600
Jackson	2	575	575	3,450	3,450	4,950
Jasper	7	3,500	3,500	19,850	19,850	22,700
Jefferson	2	580	580	4,740	4,740	11,832

TABLE IV—CONTINUED

COUNTY.	Number of producers.	THOUSANDS.		VALUE.		
		Common brick.	Total brick.	Common brick.	Total brick.	Total clay.
Johnson	5	2,180	2,190	$ 10,900	$ 10,980	$ 16,880
Jones	4	605	680	3,847	4,447	9,799
Keokuk	8	1,955	1,955	12,230	12,230	21,910
Kossuth	1	.....	.....	.....	.....	.....
Lee	6	3,310	3,410	19,525	20,425	20,425
Linn	11	5,029	5,069	27,287	27,607	32,359
Louisa	3	825	825	5,100	5,100	7,100
Lucas	2	340	340	2,000	2,000	2,000
Madison	3	625	625	3,850	3,850	3,850
Mahaska	5	2,070	6,070	13,230	51,230	56,580
Marion	2	940	950	6,050	6,125	16,275
Marshall	6	2,535	3,535	16,145	23,645	31,355
Mills	6	1,324	1,324	8,785	8,785	8,785
Monona	1	.....	.....	.....	.....	.....
Monroe	3	286	286	1,476	1,476	1,476
Montgomery	3	3,694	3,719	20,571	20,759	27,397
Muscatine	10	3,089	3,089	16,211	16,211	25,811
Page	5	3,370	3,370	20,720	20,720	21,220
Pocahontas	1	.....	.....	.....	.....	.....
Plymouth	1	.....	.....	.....	.....	.....
Polk	20	24,087	21,621	147,116	288,857	347,257
Pottawattamie	9	7,890	8,390	48,837	52,837	52,837
Poweshiek	3	820	820	5,240	5,240	9,915
Ringgold	6	1,050	1,250	7,150	8,350	8,350
Sac	1	.....	.....	.....	.....	.....
Scott	7	3,610	5,893	21,270	39,996	43,456
Shelby	1	.....	.....	.....	.....	.....
Sioux	2	270	270	1,800	1,800	1,800
Story	5	1,090	1,140	7,920	8,320	16,220
Tama	8	4,417	5,343	25,037	32,995	41,195
Taylor	5	1,590	1,590	10,600	10,600	10,600
Union	2	1,180	1,180	7,360	7,360	8,050
Van Buren	4	900	900	5,400	5,400	8,800
Wapello	4	4,499	7,675	28,764	55,221	55,221
Warren	3	.....	50	.....	300	1,225
Washington	6	2,728	2,728	15,254	15,254	21,672
Wayne	3	1,181	1,181	7,505	7,505	7,505
Webster	8	7,583	8,454	40,534	50,095	78,158
Winnebago	2	410	412	2,700	2,724	2,874
Winneshiek	2	850	850	5,100	5,100	5,100
Woodbury	7	21,976	22,783	121,709	128,181	128,200
Wright	3	280	280	1,855	1,855	8,618
Single producers	16	6,883	7,412	42,417	46,180	97,981
Burnt clay ballast	4	.....	.....	.....	.....	203,639
Estimates. No. 2,455	1	100	100	700	700	6,700
Total	349	181,331	223,410	$1,069,947	$1,415,165	$2,057,022

The average prices ruled higher for all kinds of brick than since 1895 for common and 1894 for pavers. The total brick produced in thousands, their total values and their average selling price per thousand, are given in Table V.

TABLE V.

YEAR.	THOUSANDS.			VALUES.			AVERAGE PRICE PER M.		
	COMMON.	PRESS'D.	VITRIFIED.	COMMON.	PRESS'D.	VITRIFIED.	Com.	Pressed.	Vitrif'd
1894	208,195	.....	45,488	$ 1,317,473	.....	$ 376,951	$6 33	.....	$8.29
1895	180,664	11,159	31,704	1,095,074	$ 87,130	243,928	6.06	$7.81	7 69
1896	172,195	6,088	14,385	1,003,634	47,386	112,985	5.83	7.78	7 85
1897	152,446	7,823	56,315	850,834	57,230	426,056	5.58	7.31	7 56
1898	181,331	7,222	35,357	1,062,947	57,252	290,463	5.90	8.14	8.24

In 1897 Iowa ranked ninth in the total value of its clay goods, and third in the value of its paving brick. In 1896 it stood ninth and seventh in the value of total clay products and paving brick respectively. Table VI gives the ten leading clay producing states for 1897 according to rank, and is taken from the reports of the United States Geological Survey.

TABLE VI.

Total Clay 1897.

Rank.	STATE.	No of active firms reporting.	VALUE.	Per cent of total product.
1.	Ohio	842	$ 10,617,684	17.43
2.	Pennsylvania	435	7,874,695	12.93
3.	New York	231	5,615,504	9.22
4.	Illinois	570	5,398,574	8.86
5.	New Jersey	115	5,322,447	8.74
6.	Indiana	580	2,812,309	4.62
7.	Missouri	202	2,396,524	3.93
8.	Massachusetts	109	2,179,396	3.58
9.	Iowa	330	1,821,247	2.99
10.	Connecticut and Rhode Island	48	1,336,670	2.19

The ten leading states in the production of paving brick for 1897 are listed below:

TABLE VII.

Paving Brick in 1897.

STATES.	Thousands.	Value.	Price per thousand.
Illinois	87,169	$719,371	$8.25
Ohio	85,665	597,905	6.98
Iowa	56,315	426,056	7.57
Pennsylvania	41,620	336,413	8.08
New York	28,145	309,564	11.00
West Virginia	38,271	289,886	7.57
Indiana	27,239	266,638	9.78
Missouri	19,620	182,625	9.31
Kansas	17,463	127,600	7.31

Stone.

The stone trade for 1898 was indeed encouraging. The producers reported almost without exception the demand for stone to run from 10 to 20 and even in a few instances, 50 per cent better than 1897. The demand for lime shows very little improvement over the preceding year. The stone quarried includes limestone, dolomite and a small quantity of sandstone. Most of the quarries are small and improved machinery is to be found in but few. Returns have been received from 161 producers and show that a total of $563,586 worth of quarry products were marketed during the year. The production was distributed as follows:

Limestone—building and road making	$ 447,424
Lime	109,600
Sandstone	6,562
Total	$ 563,586

The production by counties is given in table VIII.

In 1898 the state ranked nineteenth among the stone producers and ninth in the value of its limestone.

TABLE VIII.

Value of Stone Produced in Iowa for 1898.

	COUNTIES.	No. of quarries represented.	Dimension.	Rough, rubble and concrete.	Lime.	Miscellaneous.	Total.
1	Allamakee	1	.....	.....	.....	.....	.....
2.	Appanoose	3	$ 65	$ 19	.....	.....	$ 84
3.	Benton	4	1,145	11	$ 2,400	.....	3,556
4.	Black Hawk	9	3,730	250	.....	.....	3,980
5.	Buchanan	2	100	18	.....	.....	118
6.	Cedar	3	73,030	25,222	15,250	.....	113,502
7.	Cerro Gordo	4	2,186	100	2,880	.....	5,166
8.	Clarke	3	1,583	755	.....	.....	2,338
9.	Clayton	8	2,231	1,019	1,570	.....	4,820
10.	Clinton	5	750	578	300	$ 300	1,628
11.	Decatur	10	2,958	257	.....	.....	3,215
12.	Des Moines	8	8,100	3,785	250	.....	12,135
13.	Dubuque	8	11,185	2,398	9,600	.....	24,183
14.	Fayette	4	11,799	10	2,765	.....	14,574
15.	Floyd	4	1,118	125	300	.....	1,543
16.	Grundy	1	.....	.....	.....	.....	.....
17.	Hardin	2	6,500	900	.....	.....	7,400
18.	Henry	2	4,900	500	1,000	.....	6,400
19.	Howard	2	750	23	.....	.....	773
20.	Humboldt	2	2,240	100	.....	.....	2,340
21.	Jackson	5	1,480	600	61,950	.....	64,030
22.	Jefferson	1	.....	.....	.....	.....	.....
23.	Jones	7	91,393	3,966	.....	.....	95,359
24.	Johnson	5	1,947	1,491	300	.....	3,738
25.	Keokuk	12	3,162	101	.....	.....	3,263
26.	Lee	7	13,294	14,430	1,000	.....	28,724
27.	Linn	5	2 840	8,720	7,000	.....	18,560
28	Louisa	3	8 0	826	.....	.....	1,626
29.	Madison	7	6,471	5,176	.....	.....	11,647
30.	Mahaska	2	503	.....	.....	.....	503
31.	Marion	4	2,230	251	.....	.....	2,481
32.	Marshall	1	.....	.....	.....	.....	.....
33	Mitchell	4	845	260	1,850	313	3,268
34.	Montgomery	3	1.130	600	100	.....	1,830
35.	Monroe	1	.....	.....	.....	.....	.....
36.	Scott	8	9,591	21,365	175	.....	31,131
37.	Story	4	1,100	25	.....	.....	1,125
38.	Tama	2	270	80	.....	.....	350
39.	Van Buren	5	5,091	3,650	800	.....	9,541
40.	Wapello	4	11.800	4,100	250	.....	16,150
41.	Washington	4	6,080	325	.....	.....	6,405
42.	Webster	1	.....	.....	.....	.....	.....
43.	Winneshiek	1	.....	.....	.....	.....	.....
	Single producers	7	25,169	31,771	160	.....	57,100
	Total	161	$319 566	$133,807	$109,600	613	$ 563,586

The value of the stone produced in Iowa during the five years preceding 1898, according to the United States Geological Survey, was as follows:

1893	$ 565,374
1894	673,269
1895	468,826
1896	462,128
1897	495,343

The decline in sandstone is more fanciful than real and was largely due to an erroneous classification. The Mason City and Iowa Falls dolomites were listed as sandstones in former reports.

Lead and Zinc.

The year 1898 was marked by more lead mining in Iowa than for some time past. The Halpin mine was a large producer, yielding nearly a million pounds of ore. Aside from this a considerable amount was taken out of the Kane Bros. mine and smaller sales were made from other diggings. In all 1,856,427 pounds of ore were sold for $37,128.54. The Allamakee and Clayton county mines were not producing in 1898 and all of the ore came from the Dubuque region. It was all reduced by the Watters Smelter, at which plant a certain amount of Illinois and Wisconsin ore were also run. There were no big ore discoveries during the year though a number of small bodies were located, and early in 1899 several promising prospects were being explored.

The zinc mines were not active in the early part of the season. Small amounts of the carbonate, or bone, were taken out at Buena Vista, Durango and Dubuque. Late in the summer some of the larger Dubuque mines which had lain idle for some years were opened up, and as prices advanced during the winter, mining became quite active. In all about 750 tons of the carbonate ore were sold at prices running from $5 to $9 per ton. The total value was $5,005.47. The year was marked by the first shipments of the sulphide, jack, made from this region in recent years. The ore was sold by the Alpine Mining Co., and brought from $18 to $22 per ton. The total shipments were 76.5 tons, which brought $1,550.40. Recapitulating, the output of the district was as follows:

Lead, 1,856,427 pounds	$ 37,128 54
Zinc carbonate, 750 tons	5,005.47
Zinc sulphide, 76 tons	1,550.40
Total	$ 43,784.41